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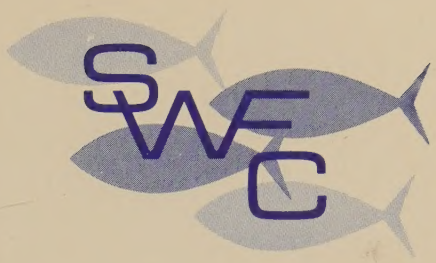

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MONTHLY REPORT - AUGUST 1982

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Pacific Environmental Group, Chief ..... *Gunter R. Seckel*
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TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - AUGUST 1982

STATUS OF PUBLICATIONS

Published

Dahlheim, Marilyn E., Stephen Leatherwood, and William Perrin. 1982. Distribution of killer whales in the warm temperate and tropical eastern Pacific. Rep. Int. Whal. Commn. 32:647-653.

Records of killer whale occurrence for the warm temperate and tropical eastern Pacific Ocean are summarized from 11 strandings/collections and 581 observations. Levels of sighting effort are identified and used to interpret trends in distribution and movement. Killer whales occur from the Gulf of California more or less continuously along the Pacific Coast from 35°N to just below 5°S. Nearly all records off California and western Baja California were within 150 nm of the coast. North of 20°N, there were only four widely scattered offshore sightings beyond 150 nm. South of 20°N, 56.6% of all sightings were within approximately 300 nm of the coast and 78.4% within 600 nm. Two offshore clusters of sightings occurred, (1) 7° to 14°N, 127° to 139°W and (2) within a band between the equator and 5°N from the Galapagos Islands to 115°W. Herds contained up to 75 animals, with a mean of 5.3 animals per herd. An estimated 91% of the herds contained fewer than 10 animals.

Santander, Haydee, Paul E. Smith, and Juergen Alheit. 1982. Determination of sampling effort required for estimating egg production of anchoveta, Engraulis ringens, off Peru. Instituto del Mar del Peru Boletin 7(1):18 pp.

Existing egg sample data from standard surveys off Peru in the past 20 years have been used for a first approximation of the number of samples required for a given level of precision of

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

estimate of egg production by the anchoveta per unit of sea surface area. The anchoveta appears to spawn in schools resulting in large proportion of the eggs being taken in a small proportion by the samples. Approximately 8% of the positive samples exceeded 4,096 eggs per m^2. An important change in the population size of the Peruvian anchoveta has been noted in 1972. The range of egg sample values was similar before and after that change but the mean number of eggs per positive sample was nearly twice as large before the population decline in 1971. Considerations of sample precision and the cost and availability of ship time in the spawning season have been merged to produce a cruise plan with useful projected precision at a reasonable cost. The survey area is 640 miles coastwide and 90 miles offshore and covers 57,600 square miles. A 30% precision of estimate requires 924 samples and a 20% precision requires 2,078 samples in this projection. Biases in the estimation of precision are discussed. The log-normal probability distribution is used to describe the positive samples.

Perrin, W.F., and C.W. Oliver. 1982. Time/area distribution and composition of the incidental kill of dolphins and small whales in the U.S. purse-seine fishery for tuna in the eastern tropical Pacific, 1979-1980. Rep. Int. Whal. Commn. 32:429-444.

Data are presented for 4,642 spotted dolphins, Stenella attenuata; 1,745 spinner dolphins, S. longirostris; 99 striped dolphins, S. coeruleoalba; 1,535 common dolphins, Delphinus delphis; two bottlenose dolphins, Tursiops truncatus; one Pacific white-sided dolphin, Lagenorhynchus obliquidens, and one false killer whale, Pseudorca crassidens. Possible source of biases in the samples are discussed.

Translations

Iwasa, Kentaro. 1981. The effectiveness of artificial fish aggregating devices (payao) on the high seas (a progress report) (Enyo kai-iki ni okeru jinkō ukigyosho (payao) no kōka ni tsuite (keika hōkoku)). JAMARC (Jpn. Mar. Fish. Resour. Res. Cent.) No. 21, p.32-39. (Engl. transl. by Tamio Otsu, 1982, 13 p., Transl. No. 68; available Southwest Fisheries Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Iwasawa, Tatsuhiko. 1982. The fisheries of Fiji (Fiji-koku no suisan jijō). JAMARC (Jpn. Mar. Fish. Resour. Res. Cent.) No. 22, p. 11-18. (Engl. transl. by Tamio Otsu, 1982, 10 p., Transl. No. 69; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Yonemori, Tamotsu. 1982. Study of tuna behavior, particularly their swimming depths, by the use of sonic tags (Chō-onpa

hōshiki-hō ni yoru maguro-rui no yuei suishin no kenkyū). Enyō (Far Seas) Fish. Res. Lab. (Shimizu) Newsl. No. 44, p. 1-5. (Engl. transl. by Tamio Otsu, 1982, 7 p., Transl. No. 70; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812.)

Administrative Reports

La Jolla Laboratory

Domowitz, I. 1982. Nonlinear regression with heterogeneous observations. SWFC Admin. Rep. LJ-82-20.

Domowitz, I. 1982. Program documentation for nonlinear squares estimation of anchovy population dynamics models. SWFC Admin. Rep. LJ-82-21.

Domowitz, I. 1982. Estimation of anchovy population dynamics models. SWFC Admin. Rep. LJ-82-22.

Huppert, D. and C. Thomson. 1982. California's northern anchovy fishery in 1981/1982. SWFC Admin. Rep. LJ-82-19.

Leatherwood, S. and W.A. Walker. 1982. Population biology and ecology of the Pacific white-sided dolphin Lagenorhynchus obliquidens in the northeastern Pacific. SWFC Admin. Rep. LJ-82-18C.

Oliver, C.W. and R.B. Miller. 1982. Time/area distribution and composition of the incidental kill of small cetaceans in the U.S. purse-seine fishery for tuna in the eastern tropical Pacific during 1981. SWFC Admin. Rep. LJ-82-17.

Approved by Center Director

Benirschke, Kurt, John R. Henderson and Jay C. Sweeney. Vaginal fetus in the common dolphin, Delphinus delphis. For consideration for publication in the IWC Cetacean Reproduction Conference Papers.

DeMaster, Douglas P., Daniel J. Miller, Daniel Goodman, Robert DeLong, and Brent S. Stewart. Assessment of California sea lion/fishery interactions. For consideration for publication in Transactions of the North American Wildlife Society.

Lasker, Reuben and Alec MacCall. New ideas on the fluctuations of the clupeoid stocks off California. For publication in the JOA Conference Papers.

Laurs, R Michael. The need for satellite ocean color measurements in fisheries research and related activities. For publication in the SPIE Conference Proceedings.

Lo, Nancy C.H. Application of random-effects model to estimation of batch fecundity of northern anchovy - sample size determination. For consideration for publication in Biometrics.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Spiny Lobster Catch Rates Analyzed

Richard N. Uchida, Leader of the Insular Ecosystem Study Task, reports that he continued analysis of cruise data collected from trapping operations for spiny lobster, Panulirus marginatus, in the Northwestern Hawaiian Islands (NWHI). Based on data collected for the entire 5-year period of the survey, Uchida found the following pre-exploitation catch rates from the various islands and banks surveyed:

Island or bank	Catch (No.)	Trap-night (No.)	Catch/trap-night (No.)
Middle Bank	0	40	0.00
Nihoa	255	250	1.02
Nihoa West Bank	161	244	0.66
Necker Island	9,086	2,414	3.76
French Frigate Shoals	151	452	0.33
St. Rogatien Bak	41	59	0.70
Gardiner Pinnacles	580	424	1.37
Raita Bank	405	474	0.85
Maro Reef	3,496	922	3.79
Laysan Island	588	434	1.35
Pioneer Bank	0	24	0.00
Lisianski Island	9	299	0.03
Bank No. 8	0	31	0.00
Salmon Bank	2	48	0.04
Pearl and Hermes Reef	402	567	0.71
Midway Islands	576	281	2.05
Kure Atoll	189	256	0.74

Of the 17 banks and islands investigated, only Necker and Maro Reef had lobsters in commercial concentrations. The pre-exploitation catch rate at Necker was 6.7 lobsters per trap-night in 1976. Continued fishing on the spiny lobster resource at Necker after 1976 produced progressively lower catch rates and the catch rate was reduced to only 1.03 lobster per trap-night in 1981.

At Maro Reef, however, the catch rates remained relatively high, varying between 2.3 and 3.6 lobsters per trap-night during 1977-1981. The legal-to-sublegal lobster ratio also differed considerably: 49:51 at Necker and 76:24 at Maro Reef over the 5-year period of the survey. Uchida noted that the catch rate at Necker was highest in the 55- to 64-m (31- to 35-fathom) depth

range where 32 trap-nights of effort yielded 94 lobsters, or 2.9 lobsters per trap-night. At Maro Reef, the highest catch rate was obtained at the 0- to 9-m (0- to 5-fathom) depth range where 26 trap-nights yielded 119 lobsters, or 4.6 lobsters per trap-night.

Various Activities Occupy Investigators in Insular Ecosystem Study

Research assistant Michael P. Seki received five Decapterus sp. caught at Maro Reef from Henry Y. Okamoto, Aquatic Biologist from the Hawaii Division of Aquatic Resources. Seki photographed the specimens and made meristic counts before shipping the specimens to the Philadelphia Academy of Natural Sciences for positive identification. Seki noted that the identification of the specimens will assist in clarifying the status of Decapterus in Hawaiian waters.

In connection with the Honolulu Laboratory's involvement in the Ocean Thermal Energy Conversion project, Seki also completed a literature search on the attraction and avoidance of marine organisms relative to man-made structures placed in tropical and subtropical waters of the Pacific. He began preparation of a brief report on the literature search for submission to the Office of Ocean Minerals and Energy in Washington, D.C.

* * * * * * * * * *

Research assistant Robert L. Humphreys, Jr. revised his manuscript, "Ciguatera and the feeding habit of the greater amberjack, Seriola dumerili, in the Hawaiian Archipelago" and also worked on a request from Dr. Jeffrey J. Polovina, mathematical statistician, for information on diet composition and food requirements of flyingfishes, Exocoetidae, which will be used in the ecosystem model being developed for French Frigate Shoals by Dr. Polovina.

* * * * * * * * * *

Research assistants Bert S. Kikkawa and Alan R. Everson completed the first draft of a report on the sexual maturity, fecundity, and spawning of the greater amberjack in Hawaiian waters. The data indicated that the amberjack spawns throughout the year but that spawning peaked in March and April. The size at first spawning of the females was about 78 cm fork length (FL) (about 2.5 yr old). Fecundity ranged from 1.3×10^6 to 4.0×10^6 eggs for fish from 83.0 to 118.6 cm FL.

Everson also continued his study on the sexual maturity and fecundity of ehu, Etelis carbunculus. Using Van Dalsen's volumetric technique he estimated that the number of eggs per spawning ranged from 350,000 for a fish 38 cm FL to 1 million for a fish 49 cm FL. The relationship between fecundity and length appeared to be linear. Everson is also investigating the size at first spawning, variation in the mean monthly gonadosomatic index (GSI), the relationship between GSI and various arbitrary stages of maturity, monthly and areal variation in sex ratio by size classes, and the possible effects of environmental factors as triggering mechanisms for spawning.

* * * * * * * * * *

James H. Uchiyama, Fishery Biologist, reviewed a manuscript, "Congrid leptocephali in the western and middle Pacific - I. Exterilium Ariosoma-type larvae," by N. Mochioka, Faculty of Agriculture, Kyushu University; S. Kakuda, Faculty of Applied Biological Science, Hiroshima University; and O. Tabeta, Department of Agriculture and Biology, Shimonoseki University of Fisheries.

FISHERIES MANAGEMENT RESEARCH PROGRAM

Fishery Economics Studies Continue

Samuel G. Pooley, Industry Economist, reports that the monthly survey of the Hawaiian Wholesale Fish Dealer project to collect price and quantities has been completed and the sampling effort redirected to enumerating annual quantities and revenues for the retail and insitutional sectors of the Hawaii fish market. A summary of the findings from the enumeration phase of the wholesale dealer segment of the study was issued as an administrative report this month.

Data collection for the tuna longline segment of the cost-earnings study of Hawaii fishing vessels has essentially been completed. However, sampling of the deep-sea ika-shibi and bottom fish fishing vessels has been delayed because an inventory of these types of vessels has not been produced by the Vessel Inventory Phase II project. Sampling may possibly be conducted by random sampling of boats documented or registered as commercial fishing boats.

Because of the continuing interest in billfish management and the Honolulu Laboratory's recreational valuation project, which is to be initiated shortly, an administrative report was released this month which summarizes results from the Laboratory's 1976 Kailua-Kona, Hawaii survey of commercial and recreational fishers.

Data Collected From Hawaii Wholesale Fish Dealers

Computer programmer Randy F. Stark continued to work on the fishery data collected from the Hawaii wholesale fish dealers by the Western Pacific Regional Fishery Management Council (WPRFMC) and the Honolulu Laboratory staff. These data were collected to provide new information on the domestic catches of billfishes, mahimahi, wahoo, and sharks for inclusion in an updated draft Fishery Management Plan. Computer summaries of landings and revenues were produced for the years 1979-1981 and delivered to the WPRFMC staff last month.

Second Phase of Vessel Inventory Project Delayed

Dr. Robert A. Skillman, Leader of the Fishery Management Research Task, reports that the Office of Management and Budget has disapproved the Laboratory's submission for conducting Phase II of the Vessel Inventory Verification/Classification project. The Honolulu Laboratory conducted Phase I of this project which essentially assembled the public record of documented and registered vessels in the central and western Pacific. An inventory of vessels classified by fishery is needed so that the Honolulu Laboratory and the Western Pacific Regional Fishery Management Council (WPRFMC) can carry out studies on the commercial and recreational fisheries in the region.

Recreational Fishing Data Transcribed

As part of the effort to monitor the recreational fishing community in Hawaii, Thomas S. Hida, Fishery Biologist, and research assistant Graydon A. Keala have completed transcribing recreational fish catch data from the magazine, Hawaii Fishing News, for all of 1981 and January-August 1982. To answer some questions regarding possible increases in the number of fishermen or fishing effort in Hawaii, the number of licensed commercial fishermen has been hand-tallied for 1981 and 1982 from the records of the Hawaii Division of Conservation and Resource Enforcement.

Hawaii Landings of Skipjack Tuna Below Long-Term Average

The August 1982 Hawaii landings of skipjack tuna were estimated at 235 metric tons (MT), which is 98 MT below the August 1981 landings and 348 MT below the 1964-1979 long-term average for August. The cumulative landings from January through August were estimated at 1,382 MT, which is 356 MT below the 1981 landings for the same period and 1,703 MT below the 1964-1979 long-term average for the same period (Figure 1).

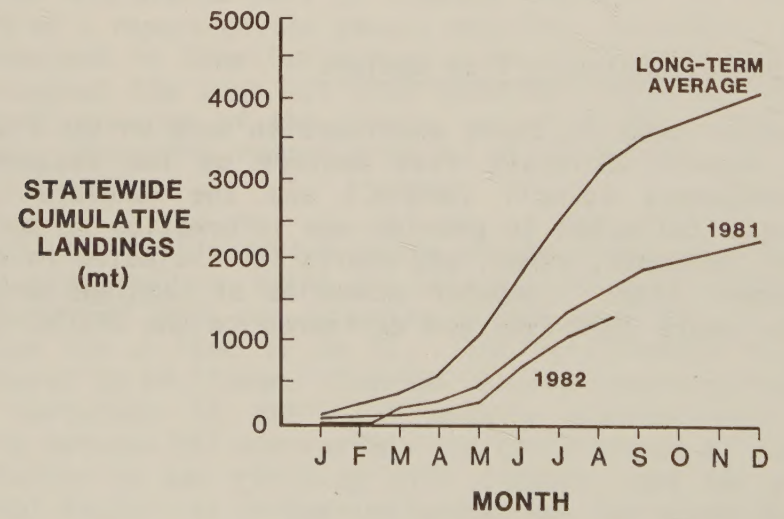

Figure 1.--Cumulative landings in the Hawaiian skipjack tuna fishery.

DATA MANAGEMENT AND TECHNICAL SERVICES

Progress Made in Data Management System

Fletcher V. Riggs, Leader of the Data Management and Technical Services, reports that Ronald C. Antinoja, Computer Technician, has completed the development of two program generators for the Resource Assessment Investigation of the Mariana Archipelago (RAIOMA) data management system. The programs, written in DEC Basic+2 for the East-West Center's PDP 11/70, use a relatively small amount of vital information maintained in the field definition files created by the USER-11 data base management system and produce an extensive entry language code for data input and verification programs. It now takes less than 1 hour to produce the software required for these two crucial first steps in the processing of incoming data from the RAIOMA field surveys.

The remaining steps in the system consist of data validation (checking and editing), data transfer to the University of Hawaii IBM 370/158, and basic data summarization using the SAS data management and statistical analysis software package. The data validation and SAS analysis steps still require some specific programming for each data source, although the existence of previously developed programs for similar data source tends to simplify this task. The intersystem data transfer process has been completely automated using the East-West Center's RJE communications link with the University's IBM system. All files developed from the various sources of incoming data are handled by a single intersystem transfer procedure.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

Egg Sample Distribution Parameters Summarized for Peru and California Anchovy Eggs

Dr. Paul Smith, Fishery Biologist, and Ms. Connie Fey, Lab Assistant II of Scripps Institution of Oceanography, have completed the data analysis and descriptive phases for comparing sampling parameters for the northern anchovy, Engraulis mordax, off the Californias, and the Peruvian anchoveta, Engraulis ringens. The Peruvian anchoveta egg sample parameters were published this year, and this work will provide background documentation for a paper being prepared by Dr. Smith, Dra. Haydee Santander of the Instituto del Mar del Peru (IMARPE), and Dr. Juergen Alheit of the Programa Cooperativo Peruano-Aleman de Investigacion Pesquera (PROCOPA).

It is necessary to know the sample parameters of the egg distribution to determine the required sampling effort. The Peruvian anchoveta and the northern anchovy are similar in that the statistical distribution of the number of eggs per sample is symptomatic of aggregations. Thus the sample variance is a biological fact rather than some procedural error. The degree of aggregation changes as the eggs are spawned by clusters of ripe females and males in schools and the eggs are subsequently dispersed by turbulence in the sea. The distributions used are the "normal" where the means and variances of sample sets are independent, the "Poisson" where the means and variances are equal, and a group of "aggregated" distribution in which the variance is proportional to the mean. As shown in Figure 1, the proportionality of the variance and the mean does not change very much among years in a time series or between two of the species in the important genus Engraulis.

This general finding supports the conclusion by Dr. Roger Hewitt that there have not been measurable changes in the rate of turbulent dispersal of larvae.

* * * * * * * * * *

Another project is nearing completion by Dr. Paul Smith and computer programmer Cindy Meyer on the sample distribution of sardine eggs. This will document the contribution to work by Dr. Jurgen Alheit, Dra. Haydee Santander and Dr. Paul Smith on the comparison of another schooling coastal pelagic fish, Sardinops sagax, off the Californias and Peru with the Engraulis species.

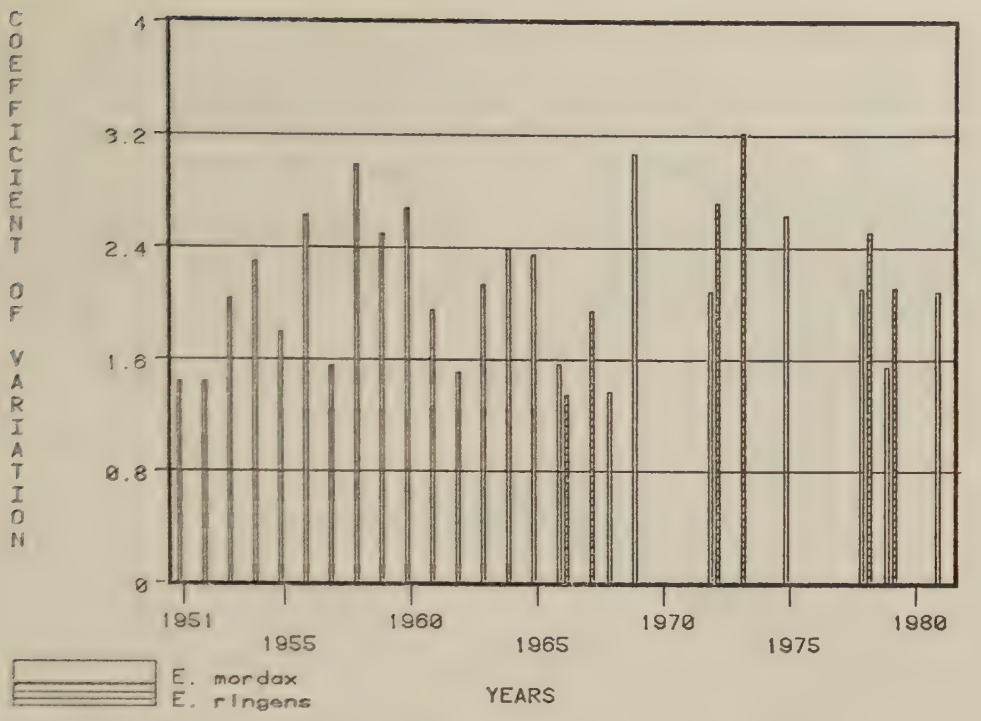

Figure 1. Comparison of Engraulis egg samples.

New Procedures Developed for Updating Oceanographic Data Files

Progress was made this month on implementation of new procedures for updating the Southwest Fisheries Center (SWFC) CalCOFI oceanographic data file. With the demise of Scripps' Data Collection and Processing Group (DCPG) and the adoption by Scripps and the SWFC of separate (and incompatible) shipboard computer systems for collecting CTD (conductivity, temperature, and depth) data, there was no longer a mechanism for combining all oceanographic data taken at CalCOFI stations into standardized formats. Consequently, no data had been available for the SWFC file from cruises conducted after 1978.

Recently, through the cooperation of Sarilee Anderson at Scripps, processed CTD data taken from the New Horizon during three CalCOFI cruises in 1981 have been received on magnetic tapes. Larry Eber, Oceanographer, has written software for the VAX computer to read these tapes, reformat identification fields to make them compatible with CalCOFI biological files, and copy the data into VAX files.

Processed CTD data taken from the David Starr Jordan on CalCOFI cruises since 1978 are also becoming available on the VAX computer as a result of procedures developed by oceanographer Ken Bliss to transmit data to VAX from the HP9825 tape cartridges.

The CTD data, processed at Scripps and at SWFC, are digitized at 1 and 2 meter increments, respectively, while the existing SWFC oceanographic file

contains data only for standard depths (or observed Nanson bottle depths) at increments of 10 to 100 meters. The enhanced resolution will provide more meaningful depictions of parameters such as the stability in a water column, which depends on the vertical distribution of density. An example is given in Figure 2, which shows stability in the upper 500 meters at CalCOFI station 100090 measured in April 1981. The values plotted represent differences of sigma-t (density) at 1 meter depth intervals, smoothed by computing weighted, running means for sets of three successive points. The maximum values occur in the layer at approximately 90 to 140 meters and define the pynocline.

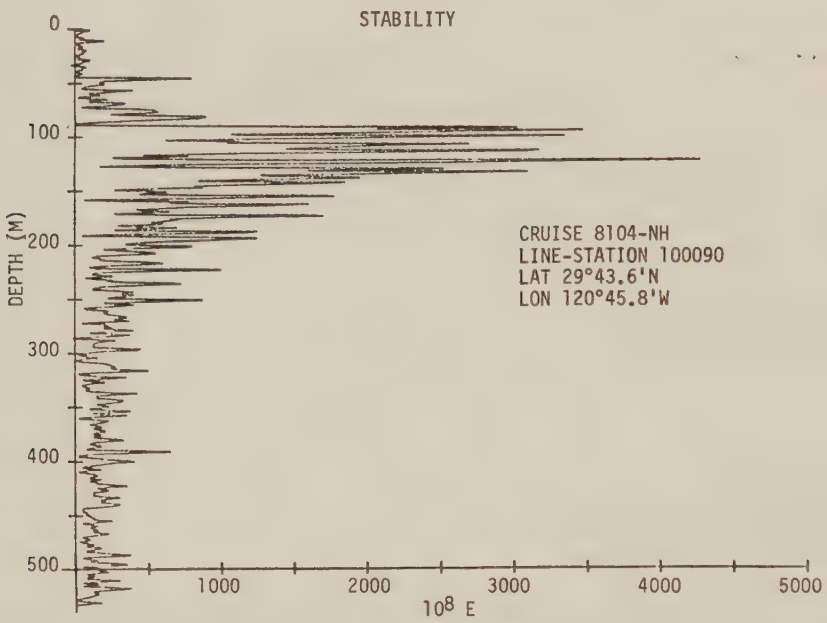

Figure 2. Stability in water column at various depths.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Anchovy Production Model Estimated with New Statistical Technique

Dr. Ian Domowitz, a recent graduate of the University of California at San Diego's Economics Department and on contract with fisheries economist Dr. Dan Huppert, adapted a statistical technique developed in his thesis research to fit a production model to the new time series of anchovy biomass estimated from egg production.

The non-linear least-squares weighted regression is designed to adjust for non-uniform variance, to identify serial auto-correlation in the residuals and to test for misspecification of the model. The results of this work are described in three Southwest Fisheries Center Administrative Reports (see Status of Publications section, this issue).

Progress Made in Contract Study of Limited Access Alternatives

Alternatives for limiting access to multispecies west coast fisheries are currently under study. Dr. Dan Huppert, Fisheries Economist, reports that a first draft of the subject study was received from Phil Meyer, principal investigator on the contract, on August 5, a month behind schedule. After a thorough review and edit, the next draft was received on September 1. This draft is being circulated to about 60 invitees to a September 27-28, 1982, workshop on limited entry. Additional copies of the draft contract report, which will be revised following the workshop, are available from the Pacific Fishery Management Council.

Anchovy Trawl Data Base Created

As data manager of the anchovy trawl survey data base, Susan Picquelle, Statistician, reviewed all existing data sets from trawl surveys for anchovy that have been conducted by SWFC since 1977. Picquelle reorganized the data base by creating a separate file for each cruise and by putting similar files into the same format. The resulting data base includes 31 data files which fall into four categories:

1) original data on individual fish including length, weight and spawning condition information,

2) revised data on individual fish where the spawning condition data is recoded into current notation, and other modifications are made to make the data comparable from year to year,

3) summary data where the data for fish from each trawl are totalled,

4) data on subsamples of females with hydrated ovaries, for the purpose of studying batch fecundity.

Picquelle documented each file by describing its contents, the origin of the data, how the file was created, and the format and definition of the data in the file. Upon request by Dr. John Hunter, Fishery Biologist, Picquelle also produced tables of each cruise that summarize the occurrence of the various spawning condition parameters.

Center Scientist Travels to South Africa

Alec MacCall, California Department of Fish and Game biologist at the La Jolla Laboratory, spent the month in Cape Town, South Africa at the invitation of the Sea Fisheries Institute of the South African Department of Agriculture and Fisheries. Besides many discussions with individuals and small groups, several seminars were presented and the visit culminated in a symposium and 3-day workshop on anchovy fisheries sponsored by the Benguela Ecology Programme

(BEP). The BEP is a consortium of government and university departments which has been modelled after the California Cooperative Oceanic Fisheries Investigations program. MacCall is preparing a detailed trip report.

PFMC Requests Amendments to Anchovy Fishery Management Plan

A planned major revision of the Anchovy Fishery Management Plan (FMP) will incorporate a new biological model based on egg production estimates of spawning biomass. This month fishery biologist Dr. Richard Methot traveled to the Pacific Fishery Management Council (PFMC) meeting in Portland, Oregon to present the results of last month's anchovy fishery workshop which questioned the accuracy of the new biomass estimates. The PFMC decided to delay the major revision of the anchovy FMP so that fishery and age composition data can be used to check the accuray of the population model. However, the Council also requested immediate amendments on the minimum size limit and quota reserve. Dr. Methot has prepared drafts of the requested amendments.

Anchovy Age Composition Data Analyzed

Dr. Richard Methot, Fishery Biologist, continued analysis of age composition data from the anchovy fishery and sea survey conducted by the California Department of Fish and Game. Recently, Dr. Methot used the age composition data to smooth the biomass time series before Dr. Ian Domowitz, an economist working on contract to the La Jolla Laboratory, fit a production model to the time series.

Between-year survival rates of each year class were calculated from age compositions weighted by initial biomass estimates. The survival rates were highly variable and the several-year classes sampled each year typically had similar deviations for mean survival. The biomass estimates were adjusted to smooth the time series of survival from age 3 to age 4. The adjustment reduced the standard deviation of $\log_e$ (survival at age 3) from 1.53 to 0.68. Similar reductions in variance of survival at age 1 and 2 were achieved even though the procedure only attempted to reduce variance at age 3. Variances in survival at age 4 and 5 were relatively unaffected. The resultant biomass time series was more precisely fit by the production model.

COASTAL EASTERN PACIFIC: POPULATION BIOLOGY OF FISHES

Histological Observations of the Gas Bladder of 12 and 14 Day Old White Seabass Larvae

Larvae of white seabass spawned and reared at the La Jolla Laboratory last April were studied for suspected gas bladder problems that may be the cause of sudden heavy mortality of 14-day-old larvae. Thirteen 12-day-old and 20 14-day-old larvae were sampled, the latter selected according to their

color, location in the water column and swimming behavior. They were immediately fixed in Bouin's solution and run through the standard histological procedure using Harris haematoxylin and eosin-phloxine stain.

Histological sections indicated all 12-day-old larvae to be physostomous, i.e., the gas bladder and the cardiac stomach were connected by a pneumatic duct. The gas bladder lumen was filled with the gas-secreting red glands composed of pseudo-stratified columnar epithelium penetrated with crypts. A highly vascular rete mirabile generally occurs in the right postero-ventral walls of the gas bladder, with a branch extending around the dorso-lateral origin of the pneumatic duct. The numerous parallel venules of the rete mirabile eventually fused together and extend ventro-anteriorly into the hepatic portal vein.

Of the 20 14-day-old larvae, 3 (1.68-1.78 mm SL, fixed length) still had pneumatic ducts, while 17 (1.78-2.23 mm SL, fixed length) were already in the physoclistous condition. The disappearance of the pneumatic duct seems to be a critical period in the early life of the white seabass. The red glands that fill the gas bladder lumen at day 12 now occurs only at the sides of the posterior half of the bladder. The larvae that were swimming normally in the midwater column showed well-developed red glands and its associated rete mirabile. Some of those sampled near the surface also had fairly well-developed red glands and rete mirabile, but others (35%) had less developed red glands or rete mirabile or both. The larvae floating on the surface of the water, whether light or dark colored, were mostly bloated and skinny. Their gas bladder bulged on the right side and pressed the esophagus. The red glands were practically missing and the rete mirabile poorly developed.

All the white seabass larvae studied had no "oval" where gas absorption takes place as occur in Mugil, Gadidae and other teleosts. Apparently there is a direct exchange of gases between the thin epithelial wall of the gas bladder and the blood capillary network around the posterior area. In white seabass larvae where the gas absorbing mechanism has not fully developed by 5.25 mm unfixed length or by day 14, the larvae will have difficulty maintaining its desired level in the water column and become moribund.

Age Determination of Rockfish Continues

John MacGregor, Fishery Biologist, is currently obtaining growth data for common species of Sebastodes belonging to the subgenus Sebastomus. The species being examined are Sebastes rosaceus (rosy rockfish), S. umbrosus (honeycomb rockfish), S. constellatus (starry rockfish), and S. chlorostictus (green-spotted rockfish).

The first three species have extremely deciduous scales, except for the lateral line scales, which are therefore being used for age determination. The greenspotted rockfish generally have adequate samples of intact regular scales.

The ageing of the rosy rockfish samples is completed, and the ageing of the honeycomb rockfish is almost complete.

COASTAL EASTERN PACIFIC FISHERIES ENVIRONMENT INVESTIGATIONS

SIO and SWFC Personnel Coordinate CalCOFI Data Exchange

G. Anderson and S. Anderson, Oceanographers with the Scripps Institution of Oceanography (SIO), met with oceanographers Ron Lynn, Larry Eber, Ken Bliss, and Lt. Doug Hennick of the Southwest Fisheries Center (SWFC) to coordinate the transfer of CTD (conductivity, temperature, and depth) data collected aboard the NOAA research vessel David Starr Jordan on CalCOFI surveys in 1977-1978 and 1980-1981.

Bliss has already completed programming for the transfer of these data to a mainframe computer which can, in turn, be addressed by SIO. SIO will edit the station header to suit their needs, and will review the calibrations that were applied. After the data is in final form Eber can add the data to the SWFC CalCOFI files and a copy will be delivered to NODC/EDIS. Lt. Hennick and Lynn are analyzing the oxygen probe data collected in 1977-1978; G. Anderson will assist in reviewing the oxygen values measured from water samples. The oxygen data will be part of the CTD file.

Subsequent to the meeting, Bliss transferred all CTD casts from CalCOFI cruises 7804 to the VAX computer for access by S. Anderson.

Albacore Longline Database Established

Oceanographer Ken Bliss completed programming for the transfer of 18 years of Japanese longline fishery data from the original database tape, comprised of tuna catch from all oceans, to data files comprised of tuna catch for the North Pacific. The new data files have been transferred to mini-cassette tapes on the Hewlett Packard minicomputer.

Oceanographers Lynn and Bliss have written a series of programs to analyze the longline catches of albacore and bigeye tuna in regard to distribution, effort, and catch-per-unit effort. Also included are plotting programs to produce mappings. This project provides input for 1) studies of the relation of albacore to changes in the marine environment for the albacore model, 2) historical background for a manuscript on the recent U.S. exploratory longline surveys, and 3) background for strategic decisions for an anticipated future exploratory longline survey.

CalCOFI Survey Data Provided for Mexico

In response to an administrative request, oceanographer Ken Bliss provides data printouts and profiles of temperature and salinity versus depth from CalCOFI cruises during 1980 and 1981 for delivery to the Mexican government.

Oceanic Fisheries Resources Division

MARINE MAMMAL BIOLOGY PROGRAM

Results of the Marine Mammal Salvage Program-1981

Staff of the cooperative Marine Mammal Salvage Program (CMMSP) recovered 140 marine mammals in 1981 from California beaches. One hundred and twenty-one animals were recovered from San Diego County, eight from San Clemente Island, eight from San Miguel Island, and three from other areas. Eighty-two percent of the animals were California sea lions (Zalophus californianus).

Roughly 75% of the recoveries occurred between Las Flores Beach and Mission Bay, or along approximately 49% of the San Diego County coastline. Fifty-one percent of the recoveries occurred between March and June. These patterns were similar to previous years.

Thirty-four of the specimens were fresh enough to be autopsied; all but four were sea lions. Thirty-seven percent of the sea lions had died of gunshot wounds or drowning. Eighteen percent of the animals were hypoglycemic. Nearly 70% of the sea lions exhibited gastric ulcers.

Specimens routinely collected from salvaged animals include: teeth, stomach contents, and reproductive organs. In addition, length, girth, and sex are recorded.

The specimens, along with length and size data, supply marine mammal scientists with information on food habits, parasites, age of sexual maturity, reproductive rates, and sex- and age-specific mortality rates.

Tooth material and stomach contents are being analyzed by Mark Lowry, Biological Technician, and the results are being prepared for publication. All of the strandings were reported to the Scientific Event Alert Network of the Smithsonian Institution, which publishes a monthly report of all reported strandings. Also, a 24-hour "hot line" has been established at the SWFC to facilitate the reporting of beached marine mammals by the public.

The CMMSP was established in 1979: SWFC is in charge of the recovery of dead stranded marine mammals, while Sea World Inc., accepts responsibility for live stranded marine mammals. In the 3 years since the program's inception, the SWFC has collected nearly 350 dead stranded marine mammals.

Sexual Dimorphism of Sea Lion Canine Teeth Examined

Mark Lowry, Biological Technician, and Roberta Folk, NOAA Junior Fellow, have been investigating the sexual dimorphism of sea lion canine teeth to see if there are size differences in the canine teeth of males and females. Lowry has been collecting data and specimens since 1981. The goal is to determine a

method of differentiating male and female specimens by measuring the root width and thickness of the canine tooth. This will be of great value because many beached dead animals when salvaged are greatly decomposed, and only tooth material is available.

Table 1 shows the difference between male and female canine root width and root thickness. The female teeth are noticeably smaller than the male in all categories, indicating that tooth measurements may serve as a useful means of identifying male versus females specimens.

Table 1. Measurements of canine teeth from male and female California sea lions.

	Average canine root width (mm)			
	Upper right	Upper left	Lower right	Lower left
Male	17.49	17.33	16.55	16.17
Female	10.23	10.54	9.40	9.63

	Average canine root thickness (mm)			
	Upper right	Upper left	Lower right	Lower left
Male	13.39	9.55		8.92
Female	8.71	8.61	6.33	5.92

Staff Scientists Present Papers at International Mammalogy Congress

Dr. William Perrin, Leader of the Marine Mammal Biology Program, and Dr. Al Myrick, Leader of the Marine Mammal Age Determination Project, presented papers at the Third International Theriological (Mammalogical) Congress held in Helsinki, Finland, August 14-20.

The program consisted of 450 plenary papers on specialized subjects presented by speakers in concurrent session. In addition there were poster displays, informal workshops, discussions and business meetings, and scientific documentary films and slide displays. Subjects included ecosystems modeling, population dynamics, demography and density dependence, management and control, stock assessment of exploited populations, energy budgets, reproductive biology, distribution and speciation, husbandry and commercial farming, morphology, taxonomy, age determination, physiology, paleozoogeography and conservation. Approximately 700 to 800 scientists representing over 50 countries were in attendance.

Dr. Perrin's paper, "Patterns of geographical variation in small cetaceans," delivered in the symposium on marine mammals and man, discussed

examples of variation as related to general "niche" in several nominal species of small delphinids and concluded by proposing a new system of classification for dolphins.

Myrick's paper, "Time significance of layering in some mammalian hard tissues and its application in population studies," suggested that a basic microlayering pattern in hard tissues of many vertebrate groups is based on lunar monthly cycles and that such fine layers can be used to estimate age and biological parameters of mammal life histories more precisely. Both papers were favorably received by the attending audiences and have been accepted for publication in the special symposium volumes of Acta Zoologica Fennica to be issued in 1983.

Marine Mammal Commission Reviews Monk Seal and Tuna-Porpoise Programs

On 11, 12, and 13 August 1982, representatives of the Marine Mammal Commission met with representatives of the National Marine Fisheries Service and others at the Southwest Fisheries Center, La Jolla, California, to review actions which the Southwest Fisheries Center and/or the Southwest Region of the National Marine Fisheries Service have taken or plan to take to: 1) protect and encourage recovery of the Hawaiian monk seal; 2) reduce incidental mortality and assess the status of porpoise stocks affected by the yellowfin tuna purse seine fishery in the eastern tropical Pacific; and 3) assess and, where necessary, take steps to reduce the incidental take of marine mammals and/or marine mammal-caused gear damage, fish damage and fish loss in the coastal waters of California. The review was held at the request of the Marine Mammal Commission, and was organized by Dr. Gary T. Sakagawa, Chief of the Oceanic Fisheries Resources Division of the SWFC, in consultation with Dr. Robert J. Hofman, Scientific Program Director for the Marine Mammal Commission.

MMC representatives participating in the review were: Dr. James C. Nofziger, Chairman of the Commission; Dr. Douglas G. Chapman, Chairman of the Commission's Scientific Advisory Committee; Dr. L. Lee Eberhardt, a Member of the Scientific Advisory Committee; and Dr. Robert J. Hofman, the Commission's Scientific Program Director. Mr. John R. Twiss, Jr., the Executive Director of the Commission, participated in the review of the Hawaiian monk seal program.

At the Commission's request, Dr. Robert J. Shallenberger, Director of the Hawaiian Islands National Wildlife Refuge, Dr. Robert L. Brownell, Jr., Chief of the U.S. Fish and Wildlife Service's Marine Mammal Research Program, and Mr. Gordon Reetz, Biological Program Manager for the Pacific OCS Office of the Minerals Management Service, were invited to participate in the reviews of the monk seal program and the California coastal program -- Dr. Shallenberger and Dr. Brownell participated in the review of the monk seal program; Dr. Brownell and Mr. Reetz participated in the review of the California coastal program.

The monk seal program review was held on 11 August. NMFS participants were: Dr. William G. Gilmartin, Head of the Hawaiian Monk Seal Recovery Team;

Dr. Douglas P. DeMaster, SWFC Biologist and Member of the Recovery Team; Mr. J. Gary Smith, Chief of the Fisheries Management Division of the NMFS' Southwest Region; Mr. James Lecky, Southwest Regional Office of the NMFS; and Mr. Eugene T. Nitta, Marine Mammal Coordinator, NMFS Western Pacific Program Office.

The Tuna-Porpoise Program Review was held on Thursday afternoon (12 August) and Friday morning (13 August), and was preceded by a general briefing on the marine mammal research being conducted by the Southwest Fisheries Center. NMFS representatives participating in the meeting included Dr. Izadore Barrett, Director of the SWFC, Dr. Gary T. Sakagawa, Dr. Tim Smith, Dr. William F. Perrin, Dr. Rennie Holt, Dr. Al Myrick, Dr. Steve Reilly, Dr. Jay Barlow, Ms. Aleta Hohn, Mr. Dean Swanson, and Mr. James Leckey.

TUNA AND BILLFISH RESOURCES PROGRAM

1983 Albacore Stock Assessment Research Planned

Fishery biologist Dr. Norman Bartoo reports that the Temperate Tuna and Billfish Assessment Project of the Oceanic Fisheries Resources Division outlined its major research efforts for fiscal year 1983. The upcoming work was designed with input from the Southwest Fisheries Center's Albacore Research Committee and Center Management.

A critical need that was identified involves generation of unbiased and accurate information on age structure of the historical catch data. Past estimates of age structure lacked accuracy. Recent improvements in ageing techniques as well as more sophisticated mathematical treatment of data now allow more accurate estimates of age and age structure of the population. The new age structure information will be used in age structured models such as cohort analyses.

Also critical is the continued development of the North Pacific Albacore Simulation Model. Under development since 1980, the model, by integrating biological, fishery, and environmental information, is designed to evaluate albacore population dynamics. During fiscal year 1983, investigators will continue to evaluate the stability of the mathematical representations used and will produce simulation runs of multiple, successive catch years.

An understanding of age structure of the population which actually supports the fishery is necessary in assessing albacore population dynamics by cohort analyses or simulation models. An experiment to reveal the underlying age structure of the population is planned for 1983. Exact methods have not yet been decided, but they must utilize passive gear with respect to fish behavior as well as provide a means for compensating for sampling selectivity. After reviewing available sampling methods, acoustic surveys and research gillnets appear feasible. Experimental designs are being developed for a cruise in August 1983.

Status of Tuna/Porpoise Data

Frank Ralston, Data Base Manager, provided the following table of the status of the compiling and editing of U.S. tuna/porpoise data. The cycle in the table refers to periods of increased fleetwide fishing effort as forecasted by increases in vessel departure.

Cycle	Cruises planned	Cruises departed	Cruises returned	Cruises being processed	Cruises fully processed
1	15	16	15	2	13
2	12	6	3	2	1
3	14	1	0	0	0

TIBURON LABORATORY

FISHERIES DEVELOPMENT INVESTIGATION

Preparations Made for Jordan Cruise

This month NOAA Corp Lt. Pat Rutten and student trainee Frank Jacques constructed fish-trapping gear for use on the forthcoming cruise of the NOAA research vessel David Starr Jordan. The primary objective of the cruise is to locate areas of abundance of tanner crab. Other activities will include trapping spot prawns and sanddabs, collecting and processing fish for market trials; and producing surimi (raw material for fishcakes) from shortbelly rockfish. The cruise is scheduled for 29 August - 8 September; the Jordan will operate near San Franciso, California.

Squid Sorting Study Continues

In May of this year, staff from the Fisheries Development Task initiated a study of the feasibility of sorting squid by sex, since whole female squid with eggs bring a higher price in Japanese markets than do mixed-sex packs.

This month, six samples of squid were processed in the ongoing effort to determine the cost effectiveness of the sorting procedure. An economic analysis has not yet been applied to the data; however, it is apparent that sex sorting can be accomplished quickly and accurately. Over the course of the experiment (10 May - 2 August) there has been some variation in the sex ratios, but very little variation in edible yield when the squid are cleaned.

FISH COMMUNITIES INVESTIGATION

Preparations Made for Western Groundfish Workshop

Dr. William Lenarz, Leader of the Rockfish Analysis Task, met with Mr. Frank Henry of the California Department of Fish and Game on 18 August in Menlo Park, California. The two biologists discussed preparations for the Second Western Groundfish Workshop that will be held 10-12 January 1983 at the Asilomar Conference Center near Monterey, California.

There has been considerable interest in the workshop: a special session of eight invited papers on rockfish has been organized, and titles of 36 contributed papers have been submitted.

Tentative plans have been made to hold a half-day meeting on rockfish ageing after the workshop at the California Department of Fish and Game

Laboratory in Monterey. Significant progress has been made on rockfish ageing during recent years and a number of biologists believe that there is a need for a forum to discuss the progress and possible cooperative work on the remaining problems.

A second announcement of the workshop is being prepared for distribution to potential participants.

Rockfish Data Base Formed

Since 1977, members of the Rockfish Analysis Task and the California Department of Fish and Game have combined forces to collect and manage data from commercial and recreational rockfish landings in central and northern California. Their efforts have resulted in the formation of a large data base on rockfish, which provides input for quantitative approaches to catch analysis.

Programs to determine catch estimates by species, sex, length, and age assemblages for any combination of geographic locations and time periods are presently being developed and executed by fishery biologist Candis Cooperrider, and computer programmer/analyst Fredric Plotkin. The reports generated from these programs will be distributed in a format for use by those responsible for rockfish management decisions for the coast of California.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Chronic Toxic Chemical Exposure Threatens Striped Bass Population

The abundance of striped bass in the San Francisco Bay and Delta regions has decreased over the last several years. Concerned with the future of this popular sport fish, scientists from the Southwest Fisheries Center's Tiburon Laboratory, the University of California at Davis and Santa Cruz, and the California Department of Fish and Game have been studying likely causes of the decline. Their research efforts have focused on the effects of pollutants, the long-term impact of water-diversion projects in the Delta, decreases in food supply, and over-fishing.

This month, the State Water Resources Control Board, which supports some of the various studies, made public new scientific information on the effect of chronic toxic chemical exposure on striped bass. Research results show that such exposure seriously affects every stage of the striped bass life cycle: 1978 field studies reveal that fish affected by toxic pollutants and parasites produced 45% fewer normal eggs; laboratory fish accumulate petroleum hydrocarbons at levels sufficient to reduce first-year survival; and this same pollution may make adult striped bass more vulnerable to parasitic infection, increasing the adult mortality rate.

The studies show that petroleum products and zinc have the greatest impact on fish reproduction and health. In the Bay-Delta estuary over 125,280 gallons of oil were spilled in 1980, nearly triple the 1978 volume. Hydrocarbons found in treated sewage, refinery wastes, pesticides, and stormwater runoff add to the problem.

Scientists compared Bay-Delta striped bass with similar populations in the Coos River, Oregon area as part of their assessment. The Oregon fish, generally older and larger, were in better health and carried significantly lower toxic pollutant tissue burdens than Bay-Delta striped bass. Oregon striped bass had none of the tapeworms that infest Bay-Delta fish. Within California, San Joaquin River striped bass had higher pollutant residues, more parasites, and were in poorer health than Sacramento River striped bass.

In response to the problem, State and Regional Water Boards may attempt to reduce petroleum discharges and improve spill control measures for Bay-Delta receiving waters. Additional study on the source and control of zinc is needed. The Department of Food and Agriculture may be asked to investigate the feasibility of reducing discharges from over two million pounds of petroleum-based pesticides used annually in the Delta.

PACIFIC ENVIRONMENTAL GROUP

FISHERY/ENVIRONMENTAL MODELING AND FORECASTING TASK

Cooperative Study of the Peru-Chile Current System Initiated

Comparative studies of the Eastern Boundary Current, which includes the California, Peru-Chile, Canary, and Benguela Current systems, are part of the work conducted by the Pacific Environmental Group (PEG) in Monterey, California. As part of this project, Dr. Fernando Robles of the Catholic University of Chile (Talcahuano, Chile) recently spent 4 weeks at PEG to begin a cooperative study with oceanographer David Husby, on the interannual variability of the Peru-Chile current system.

Dr. Robles participated in the oceanographic data collection of the Chilean Fisheries Development Institute (IFOP), which conducted over 140 biological and oceanographic survey cruises off the northern and central coast of Chile between 1963-1973. Robles made the oceanographic data from the IFOP surveys available to PEG so that they could be merged with those in the "Master Oceanographic Observation Set" at the Fleet Numerical Oceanography Center in Monterey, California. The new data set permits an investigation of the interannual fluctuations in the geostrophic flow of the major water masses off northern and central Chile. Robles and Husby will analyze the time series of geostrophic transports across oceanographic sections at Arica (lat. 18.5°S) and Valparaiso (lat. 33°S) to determine current system changes associated with El Niño phenomena between 1964 and 1973.

The goal of the comparative studies is to identify similarities and differences in the environmental dynamics in the spawning habitats of the major pelagic fish species in the various Eastern Boundary Current systems. Identification requires the assembly of seasonal and geographical climatologies of atmospheric forcing and ocean processes in the four current regions. Usually, scientists in countries bordering these regions have expertise and possess data which will supplement the inforation available in the U.S. Collaboration with scientists like Dr. Robles furthers the comparative studies and opens international lines of scientific communication.

FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING

Meeting of WPACFIN Data Goals Committee Held in Kailua-Kona

The first meeting of the WPACFIN Data Goals Committee was held in Kailua-Kona, Hawaii on August 17. During this primarily organizational meeting, the goals and activities of WPACFIN and the Committee were discussed. David C. Hamm, WPACFIN Project Manager, reviewed the past year's activities and accomplishments and led discussions of proposed activities and system upgrades for the next year. A second organizational meeting will be held in conjunction with the October Western Pacific Regional Fishery Management Council (WPRFMC) meeting to address selection of a Chair and adoption of the operational guidelines for the Committee. The Committee's Technical Subcommittee will also hold its first meeting at this time.

In a related activity, Hamm is supporting the redesign of Guam's data collecting and processing methods in an attempt to upgrade their system to provide Guam, the National Marine Fisheries Service (NMFS), and the WPRFMC with more accurate and complete data on a timely basis. Bids for a contract to accomplish these improvements have been reviewed and a selection made; the work should commence shortly.

Approval Granted for Extension of Computer Services

Dorothy Roll, Systems Analyst, reports that approval has been granted for the extension of computer services through June 30, 1983, at the University of California San Diego for the La Jolla Laboratory and at the University of Hawaii for the Honolulu Laboratory.

Purchase of ADP Equipment Approved

The requests for the purchase of miscellaneous ADP equipment and contract services from Fiscal Year 1982 funds have been approved by the ADP Policy Divisions of NOAA and DOC. The approved items are the HP 9826A micro-computer for the Coastal Eastern Pacific Fisheries Environmental Investigations task, the DEC's Rainbow 100 dual 8-bit Z80 and 16-bit 8088 microprocessor for ADP Operations, the APPLE system for the Pacific Environmental Group in Monterey, and the obligation of $36,000 for contract services to produce tuna/porpoise data summaries and statistical reports. Also approved is the purchase of components for seven La Jolla Standard S-100 micro-processors: two of the micro-processors are for the Tiburon Laboratory; three for the Tuna Billfish Resources Program; two for the Commercial and Recreational Fisheries Research for Management Program.

Request for Purchase of VAX 11/780 Denied

In a formal letter the Department of Commerce ADP Policy Division has denied SWFC's request to purchase the VAX 11/780. The SWFC executive staff met and reviewed alternative actions. The decisions are to continue the current processing on UCSD's VAX, move some data systems to the Seattle's Burroughs, and acquire microcomputers.

1974-1976 Summary Files Completed

Computer systems programmer Susan Iacometti completed summaries of the landings of the Coastwide Data System for 1974-1976. Personnel led by fisheries economist Dan Huppert further process the summary files before final figures are extracted. The summary of the vessel-characteristics files is completed, but will be further processed to clarify keypunching and other types of errors. All completed files and raw data files have been backed up on the VAX system copy tapes and steps have been initiated for documentation of the programs used to create these summary files.

Conversion of Financial Reporting System Discussed

Robert Nydam, Programmer Analyst, and Ben Remington, Executive Officer, had several meetings during the month to define the specifications for the conversion of the Financial Reporting System (FRS) from ADP Network Services to the VAX/microprocessor system. During the development and implementation of the conversion, the FRS will utilize the microcomputer together with UCSD's VAX. Commitment data may be entered/validated/updated on the microprocessor by the user. The validated data would be transmitted to the VAX for update to data base files. Labor data and commitment data submitted to ADP's key operator will be entered on the key-to-diskette for direct transmission to the VAX for validation and update to the base files. From a video terminal the users can query the base files for interim status reports and correct elements in the data base files through DATATRIEVE, VAX's data management system. The monthly summary reports will be generated from the VAX system.

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Susan Iacometti, Computer System Programmer, attended an Advanced DATATRIEVE Applications Workshop at the Digital Equipment Corporation's training center in Santa Clara, California, from August 18-20. Iacometti will disseminate the information she acquired during future technical users meetings.

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Systems analyst Dorothy Roll has been appointed treasurer for the Southern California and Arizona Federal ADP Council for FY 1983. She attended

a Council board meeting in San Diego, California, on August 25 to draft the tentative plans for the general meetings. The first meeting will be at the Admiral Kidd Club in San Diego on November 19.

MISCELLANEOUS

HONORS AND AWARDS

Richard Shomura Honored as Sportsman of the Year

A recognized expert on the fisheries of the central and western Pacific, Richard S. Shomura, long-time head of the National Marine Fisheries Service laboratory in Honolulu, Hawaii, was honored by the Hawaiian Invitational Allison Tuna Tournament (HIATT) as "Sportsman of the Year" and given the Aloha Airlines trophy which goes to the person who has "done most for sports fishing during the past year." Shomura received the award July 24 at the annual awards banquet of HIATT's Board of Governors.

Shomura, 54, who earned his Bachelor's and Master's degrees from the University of Hawaii has thus far spent his entire professional career with the federal fishery research agency now known as the National Marine Fisheries Service (NMFS).

Shomura has served as Director of the Honolulu Laboratory since 1973 and is the first Hawaii-born person to hold the position. As an authority on the fisheries of the Pacific basin countries, Shomura frequently serves as a member of U.S. delegations to several international fishery organizations such as the Indo-Pacific Fishery Commission, Indian Ocean Fishery Commission, and the South Pacific Commission. In addition, he has organized and participated in several international fishery workshops involving fishery scientists of the Pacific basin. He also serves as the U.S. delegate on the Indo-Pacific Fishery Commission Standing Committee on Resources Research and Development, Food and Agriculture Organization of the United Nations (FAO), FAO Regional Office for Asia and the Far East, Bangkok, Thailand.

Within the passage of the Magnuson Fishery Conservation and Management Act by Congress in 1976, which created eight regional fishery management councils throughout the United States and its possessions, Richard Shomura, as the Director of the Honolulu Laboratory, plays a leading role in providing information and advice to the Western Pacific Regional Fishery Management Council headquartered in Honolulu, Hawaii.

Shomura, who is a member of many professional societies, is the author or co-author of 43 technical papers on fish and fisheries.

Three Tiburon Staff Members Receive Awards

On August 2 an awards ceremony was held at the Tiburon Laboratory during which Dr. Izadore Barrett, Southwest Fisheries Center Director, presented an award for 1980's best paper in the U.S. Fishery Bulletin to Peter B. Adams, Fishery Biologist. Adams' prize-winning paper, entitled "Life History

Patterns in Marine Fishes and Their Consequences for Fisheries Mangement," appeared in Vol. 78, No. 1 of the publication.

At the same ceremony, Dr. Barrett presented a Sustained Superior Performance Award to librarian Maureen Woods.

Fishery Biologist Susan E. Smith was honored through the selection of three of her works of art for display at the Biological Art Show to be held at the Oakland Museum from October 9 to November 21. The three items selected were her often-reproduced painting of a striped bass, her drawing of the copepod Eucalanus attenuatus, and a watercolor of Blue-eyed grass.

La Jolla Laboratory

Elaine Sandknop, Biological Laboratory Technician, was selected as one of eight regional EEO Counselors for NOAA in the U.S.

PUBLIC AFFAIRS

La Jolla Laboratory

August 5 - Dr. John Hunter delivered a talk on the culture of marine fishes to the San Diego Fly Fishers.

19 - Dan Huppert presented a seminar on Economics and Fisheries Management to the National Marine Education Association at the University of California, San Diego.

26 - Dr. Mike Laurs presented a talk on "Fisheries applications of coastal zone color scanner data" to the Advanced Remote Sensing Conference, Society of Photo-Optical Instrumentation Engineers, San Diego, California.

Tiburon Laboratory

The San Francisco Tyee Club, a Bay Area sportfishing club, is again rearing chinook salmon in floating pens moored to the seawall at the Tiburon Laboratory. Begun as a cooperative research project with participation by U.C. Sea Grant, California Department of Fish and Game, and the Tiburon Laboratory as well as the Tyee Club, the Club and its associated Tyee Foundation now provides all of the funding and labor needed to carry out the activity as a continuing Club project. Tiburon Laboratory provides only facility support and the Department of Fish and Game furnishes the salmon.

The salmon are raised in the pens for several months and then released into the Bay after they have attained a much larger size than when placed in the pens. This provides a substantially higher percentage recovery to the

fishery and to escapement than would be true if the fry were released directly from the hatchery.

Tyee Club members understandably are quite proud of their contribution to the salmon catch and the activity has provided a central point of interest for the Club.

SEMINARS

La Jolla Laboratory

August 19 - Dr. Dennis M. King, ERG Pacific, Inc., gave a talk on "U.S. Tuna: Trends and Regional Impacts."

25 - Mr. Edward Pidgeon presented a seminar on "The Art of Implementing Change."

26 - Dr. Ian Domowitz, an industry economist on contract to the La Jolla Laboratory, presented a talk entitled "Using Least Squares to Estimate Fish Population Dynamics Models."

31 - LCDR A.E. Theberge, NOAA Corps, presented a lecture and slide show on "Operations of the National Ocean Services."

TRAINING

La Jolla Laboratory

August 16-20 - Frank Ralston, Computer Specialist - "Systems Analysis and Design Techniques - II" San Diego, California.

18-20 - Susan Iacometti, Computer Systems Programmer - "Advanced DATATRIEVE Applications," Santa Clara, California.

23-27 - Virginia Hostler, Administrative Officer - "Supervision and Group Performance," San Diego, California.

Tiburon Laboratory

August 13-19 - Nancy Wiley, Computer Program Analyst - "Pascal - the Path to ADA," Management Sciences Inst., San Francisco, California.

VISITORS

Honolulu Laboratory

August 3 - Kasuke Morita of Nagasaki, Japan, visited Thomas Hida, Fishery Biologist.

5 - Floyd S. Anders, Southwest Region, Terminal Island, California, visited Richard Shomura, Honolulu Laboratory Director.

9 - Eleanor Milliken of Dover, New Hampshire, visited Richard Shomura.

- Al Morgan, a boat builder, visited Richard Uchida, Fishery Biologist, to discuss Hawaiian fisheries.

13 - Dr. James P. McVey of the Southwest Fisheries Center visited Richard Shomura. Dr. McVey is on "loan" to the US/AID program in Jakarta, Indonesia.

16 - Francine Lee, Executive Secretary, Commission on the Handicapped, State of Hawaii, and Mr. Richard W.C. Ma, of the Audio-Visual Production Center, interviwed and photographed research assistants Jeffrey D. Sampaga, James H. Prescott and R. Uchida for the "Employing a Handi-capable Workforce" conference to be held on September 2 at the Waikiki Sheraton Hotel.

17 - Dr. Alan L. Boreham, Salmonid Enhancement Program of the Fisheries and Oceans Section of the Government of Canada, visited Richard Uchida to discuss the status of Hawaiian fisheries and the State's aquaculture program.

19 - Rick Calley, Pacific Analysis Corporation (PAC), met with Richard Shomura, Dr. Skillman, and industry economist Samuel Pooley regarding background information on commercial fishing in Hawaii for a contract PAC has with the Corps of Engineers.

- Susumu Kato, Tiburon Laboratory, who was vacationing with his family in Hawaii, visited Richard Shomura.

- Dr. Lamarr B. Trott, Deputy Director, Office of Science and Environment, Washington, D.C., visited Richard Shomura. Dr. Trott is on a 1-yr Intergovernmental Personnel Act assignment at the University of Hawaii Zoology Department.

- Gary Smith, Southwest Region, Terminal Island, California, met with Richard Shomura to discuss fishery management and WPRFMC matters.

24 - Richard McClain, fisherman and boat owner, visited Richard Uchida to discuss ika-shibi fishing and shrimp trapping prospects in the major Hawaiian Islands.

26 - Rose T. Pfund, University of Hawaii Sea Grant Program, met with Richard Shomura to discuss her NWHI public policy project.

- Dr. J.C. MacCall, Director, National Space Technology Laboratories, Mississippi, visited Richard Shomura.

La Jolla Laboratory

August 9 - Susan Pollock, KPBS in San Diego, met with Izadore Barrett, Center Director, and John Carr, Deputy Director.

10 - Rich Wheeler, NMFS Recreational Fisheries, Washington, D.C., and Jay Geniter, NMFS Southwest Regional Office, Terminal Island, California, met with Izadore Barrett, John Carr, fisheries economist Dan Huppert, and fishery biologist Jim Squire.

12 - Rear Admiral Charles K. Townsend, NOAA/NOS/PMC, Seattle, Washington, visited the La Jolla Laboratory.

16 - Jose Goulart, University of the Azores, Horta, Azores, visited the La Jolla Laboratory.

19 - Russell Rothiques and L. Arnell, California Department of Fish and Game, visited the La Jolla Laboratory.

23 - Mr. Tsai-fa Chen, Council for Agricultural Planning and Development, Taiwan, met with John Carr, Gary Sakagawa, and Al Jackson.

24-26 - Laurie Briggs, Northwest and Alaska Fisheries Center, met with Dr. Doug DeMaster.

August 30-September 3 - Mohammed Rami, FAO Fellow, Morocco, visited Dr. Paul Smith, Fishery Biologist.

19 - Daphne White, F/CM, visited the La Jolla Laboratory.

Tiburon Laboratory

August 2 - Dr. Izadore Barrett, Mr. John Carr, and Mr. Dave Mackett from SWFC, La Jolla, California.

4 - Shig Ohgami, S.F. Trading Co., San Francisco, California.

9 - Mr. Bud Armstrong, Golden Gate Fishermen's Association.

31 - Mr. Dale Gough and Mr. John Hinman from NASO, Seattle, Washington.

MEETINGS AND TRAVEL

Honolulu Laboratory

August 2-6 - Dr. Skillman attended the South Pacific Commission's 14th Technical Meeting on Fisheries in Noumea, New Caledonia.

3 - Richard S. Shomura, Laboratory Director, participated in a "redraft goals" committee meeting with Henry Sakuda, Hawaii Division of Aquatic Resources (HDAR); Dale T. Coggeshall, Fish and Wildlife Service; Doyle E. Gates, Western Pacific Program Office, Southwest Region; and Kitty Simonds, WPRFMC, at the HDAR conference room.

9-10 - Richard Shomura attended a Hawaii Undersea Research Laboratory meeting at the new Marine Science Building University of Hawaii.

12 - Richard Uchida attended a briefing on revised EEO counseling system at the Honolulu National Weather Service conference room.

15-17 - Richard Shomura, Dr. Polovina, Dr. Skillman, Samuel Pooley, and David Hamm participated in the WPRFMC/SSC Advisory panel meetings at the King Kamehameha Hotel in Kailua-Kona.

16-18 - Richard Uchida attended the Governor's Energy Conference at the Hilton Hawaiian Village Hotel Tapa Room.

21 - Richard Uchida attended the Energy Fair at the Neal S. Blaisdell Center Exhibition Hall.

24 - Dr. Glenn Hamilton, Chief, Data Systems Division, NOAA Data Buoy Office, Mississippi, met with Richard Shomura, Richard Uchida, Walter M. Matsumoto, and Alvin Katekaru and Glenn R. Higashi, HDAR, to discuss the NOAA Buoy Program.

25 - Richard Shomura, Dr. Polovina, and James Uchiyama attended a meeting of the Coordinating Council for Research/NWHI in the Honolulu Laboratory conference room.

La Jolla Laboratory

August 1-31 - Alec MacCall, California Department of Fish and Game at the La Jolla Laboratory, traveled to South Africa to discuss fisheries assessment and present seminars at the invitation of the Sea Fisheries Institute of the South African Department of Agriculture and Fisheries.

2-4 - Izadore Barrett, Center Director, John Carr, and Dave Mackett traveled to Tiburon and Monterey, California, to conduct task reviews.

3-5 - Dr. Reuben Lasker attended the Joint International Oceanographic Assembly at Halifax, Nova Scotia, to present an invited seminar to the Fisheries Symposium.

9 - Dr. Nancy Lo traveled to Oregon State University, Corvallis, Oregon, to present a talk entitled "Application of random-effects model to estimation of batch fecundity of northern anchovy-sample size determination," to the statistics department.

10-12 - Dan Huppert traveled to Portland, Oregon, to attend the Pacific Fishery Management Council meeting.

11-12 - Dr. Rick Methot traveled to Portland, Oregon, to represent the Anchovy Plan Development Team at the Pacific Fishery Management Council Meeting.

11-13 - A review of the Marine Mammal Research and Management activities of the Southwest Fisheries Center and the Southwest Region was held at the La Jolla Laboratory by representatives of the Marine Mammal Commission.

11-17 - Fred Kellenberger traveled to Honolulu, Hawaii, to attend ADP and FIN meetings.

August 13- - Dr. William Perrin traveled to Helsinki, Finland,
September 15 to participate in the Marine Mammal Symposium at the Third International Theriological Congress, and to Leningrad and Moscow, USSR, to work at laboratories of the USSR Academy of Sciences.

14-22 - Dr. Al Myrick traveled to Helsinki, Finland, to attend and present a paper at the Age-Determination Workshop of the Third International Theriological Congress.

Tiburon Laboratory

August 4-6 - Ted Hobson, Tony Chess and Dan Howard traveled to Mendocino, California, to conduct quarterly sampling studies.

10-12 - Norman Abramson and Bill Lenarz traveled to Portland, Oregon, to attend SSC - Pacific Council meetings.

PERSONNEL ACTIONS

Honolulu Laboratory

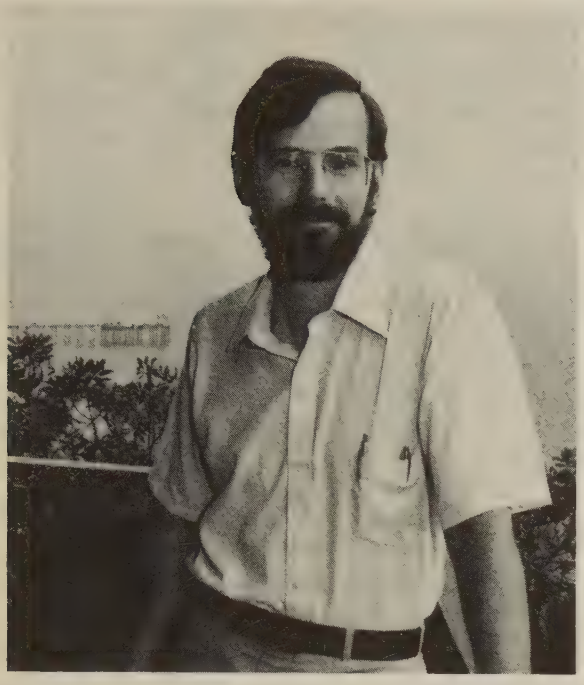
August 13 - Daniel R. Locey, Computer Science Student Trainee (Junior Fellow) - Change to Leave Without Pay status.

20 - Anne M. Houtman, Biological Aid - Termination.

27 - Miriam B. Pillos, Biological Science Student Trainee (Junior Fellow) - Change to LWOP status.

La Jolla Laboratory

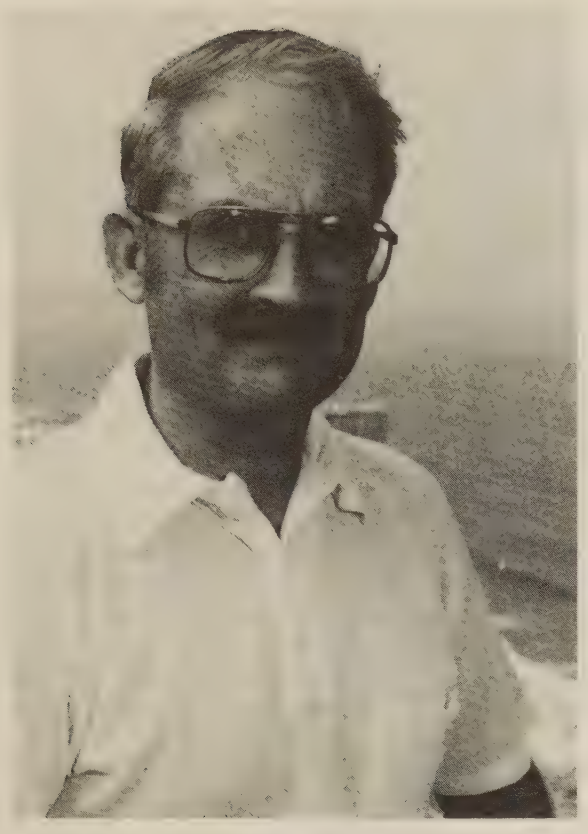
New NRC/NOAA Research Fellow Joins Coastal Division



Dr. James Power joined the Southwest Fisheries Center La Jolla Laboratory staff this month as the NRC/NOAA Post-Doctoral Research Fellow for 1982-1983. Power, who received his Ph.D. in Zoology earlier this summer from the University of Maine at Orono, is working with Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division, and fishery biologist Dr. John Hunter, in their studies of the northern anchovy (Engraulis mordax).

Power's study will focus on that stage of anchovy development known as the "critical period," a time when developmental and physiological constraints on the eggs and larvae make them especially vulnerable to environmental factors. Studies have shown that events which occur during this sensistive period may control the size of the harvestable stock.

While at the Laboratory, Power hopes to develop a mathematical model to predict the effect of a variety of environmental influences on larval distribution in the California Current. The model will take into account biotic factors, such as growth and mortality relationships, as well as physical influences, which include water temperature and currents. Power hopes that the model will serve a number of purposes, providing information on the relative importance of factors affecting the larvae; a description of larval concentration by time and place; and a simulation of many "experiments" that would be impossible to conduct in the wild. In addition, Power believes that the model may have applications to distribution in other planktonic ecosystems.



Dr. David Farris, one of the original members of the Southwest Fisheries (known then as the U.S. Fish and Wildlife South Pacific Fishery Investigations), returned to the La Jolla Laboratory this month for a 1-semester sabbatical from his teaching duties at San Diego State University. Dr. Farris joined the fisheries service nearly 25 years ago, when it was still a relatively small operation. "When I started with the fisheries, I worked in the attic of the Biology building at Stanford," recalled Farris, "and the southern part of the organization was housed in temporary buildings at Pt. Loma."

Though he left the fisheries service in 1960, Farris is well-known to many of those at the La Jolla Laboratory. Some of Farris's original colleagues, including John MacGregor and Lillian Vlymen, are still with the Southwest Fisheries Center, and a number of Farris's former students now work at the Laboratory.

Farris will spend his sabbatical studying the population biology of the California spiny lobster; he is also interested in the laboratory's ongoing work on anchovy biomass evaluation.

After his sabbatical, Farris plans to return to San Diego State University, where he has spent the last 22 years teaching a variety of biology courses. "At least I think I'm going back," said Farris with a grin, "I heard a rumor that they're changing the locks on the doors while I'm gone..."

Federal Women's Program

As a member of the Federal Women's Program Committee, Statistician Susan Picquelle wrote and distributed a questionnaire to all women employed at the SWFC. The purpose of this survey is three-fold:

1. to determine which elements of the FWPs mission the committee should concentrate upon,

2. to determine what specific activities the committee should sponsor, and

3. to collect data on how the women perceive their career situation at the SWFC.

Picquelle will summarize this information and provide the results to the women and to management. These results will provide the guidelines for the future activities of the FWP.

July 28- - William Watkins, Biological Aid - Temporary
August 29 Appointment.

6 - Shari Sitko, General Biologist - Resignation.

7 - Richard Lindsay, Biological Technician - Termination of Detail.

- Steve Grieser, Biological Technician - Termination of Detail.

- Tom Tumosa, Biological Technician - Termination of Detail.

8 - Frances Begley, Secretary - Full-time, Permanent Appointment.

- Morgan Busby, Biological Aid - Pay Adjustment to Intermittment.

- Ronald Dotson, Fishery Biologist - Full-time, Permanent Appointment.

- Bill Flerx, Fishery Biologist - Full-time, Permanent Appointment.

- M. Ragan Nicholl, Biological Technician - Temporary Appointment.

12 - Gary Frederickson, Biological Technician - Termination.

- Robert Pitman, Biological Technician - Termination.

- Michael Sinclair, Biological Technician - Termination.

16 - Lisa Ferm, Biological Technician - Pay Adjustment to Intermittment.

	17	- Alexander McConaughey-Stubbs, Economist - Resignation.
	27	- Sandra Paez, NOAA Jr. Fellow - Leave Without Pay.

Tiburon Laboratory

July	25	- Sennen Salapare, Fishery Biologist - Promotion.
	31	- Lisa Natanson, Biological Aid - Resignation.
		- Gary Combes, Biological Aid - Resignation.
August	13	- Kathryn Checkley, Biological Aid - Resignation.
	17	- Robert Hamilton, Computer Programmer - Return to Duty.
	23	- Gregory Hall, Biological Aid - Temporary Appointment.
	31	- Tammie Castillo, Clerk Typist - Resignation.
		- Kathleen Mathews, Biological Aid - Termination.
		- Laura Young, Biological Aid - Termination.
		- Gerald Kwiecien, Biological Aid - Termination.

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